

Application Serial No. 10/661,535
Amendment filed September 10, 2008
Reply to Office Action mailed June 11, 2008

REMARKS

Claims 1, 20, and 23-26 are pending in this application. Claim 25 is amended herein. Support for the amendments to the claims may be found in the claims as originally filed. Reconsideration is requested based on the foregoing amendment and the following remarks.

Response to Arguments:

The Applicants appreciate the consideration given to their arguments. The Applicants, however, are disappointed that their arguments were not found to be persuasive. The final Office Action asserts in section 2, at pages 2 and 3, that:

Although the examiner acknowledges that the specification at the part cited by the applicant states "predetermined subfield", which broadly encompasses all subfields, however, the applicant is specifically claiming the embodiment of Figures 8 and 9, which do not support the "subsequent" language of the claims since the specification clearly states on page 17, lines 11-12 that all of the cells to be written are lit in SF2. Thus all cells to be written are not lit in SF3, SF4, etc, but rather only SF2 as explained in the rejection below.

The specification, to the contrary, says only that it is not necessary to cause the *all-cell write discharge* to occur in SF3 and subsequent subfields at page 17, lines 13 and 14, not that all cells to be written are *not* lit in SF3, SF4, etc, but rather only SF2, as asserted in the Office Action.

The "all-cell write discharge" described in the specification, in particular, is a reset of all the cells due to a positive-directional slope waveform m applied during the reset period. The specification, moreover, describes the "all-cell write discharge" at page 17, lines 12-15 to be a satisfactory voltage to be applied by a negative-directional slope waveform n (a discharge for erasing only the cells discharged for display) immediately after thus sustain in SF2 and subsequent subfields of the first embodiment, or in SF3 and subsequent subfields of the second embodiment. Consequently, a reset of all of the cells is unnecessary.

The above-mentioned requirement described in the specification is intended to light all of the cells that are to be lit in any of the subsequent subfields during a display of the screen (including the relevant subfield). In the first embodiment, for example, the lowest SF with level 1 is always lit and displayed as to the cells displaying the gradation levels one or more, as shown in Fig. 6. Similarly, in the second embodiment, a second SF with level 2 is always lit and displayed as to the cells displaying the gradation levels two or more, as shown in Fig. 8.

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Further reconsideration is thus requested.

Claim Rejections - 35 U.S.C. § 112:

Claims 1, 20, 23, and 24 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The rejection is traversed.

The Office Action asserts in section 5, at pages 3 and 4, that:

Thus all of the cells to be written are not written in at least one subfield subsequent to the second subfield.

The specification, to the contrary, says only that it is not necessary to cause the *all-cell write discharge* to occur in SF3 and subsequent subfields at page 17, lines 13 and 14, not that all of the cells to be lit in a display field have been lit in SF2, as asserted in the Office Action.

The Application, moreover, describes at page 17, lines 6-10, that:

The drive waveforms in SF2 are the same as the drive waveforms in SF1 in the first embodiment and the drive waveforms in SF3 and subsequent subfields are the same as the drive waveforms in SF2 and subsequent subfields in the first embodiment.

With respect to the first embodiment, the Application describes at page 14, lines 34-37, continuing at page 15, lines 1 and 2, that:

In SF2, the all-cell write discharge, which has been caused to occur in SF1 during the sustain period, is not caused to occur, but only the inclined wave-shaped charge control pulse is applied and the period NE is not provided. The subsequent subfields are the same as SF2 only with exception of the length of the sustain period.

Thus, the drive waveforms in SF3 and subsequent subfields, which are the same as the drive waveforms in SF2 and subsequent subfields in the first embodiment, are “addressing, in at least one subfield including and subsequent to the second subfield and substantially near a head of the display field, all of the cells to be written in the respective address periods of the plurality of successive display subfields in the display field” as recited in, for example, the fourth clause of claim 1. Claims 1, 20, 23, and 24 are thus submitted to comply with the written description requirement within the meaning of 35 U.S.C. § 112, first paragraph. Withdrawal of the rejection is earnestly solicited.

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Claim Rejections - 35 U.S.C. § 112:

Claim 25 was rejected under 35 U.S.C. § 112, second paragraph, as indefinite. The rejection is traversed.

The Office Action asserts in section 7, at pages 4 and 5, that:

The limitation is indefinite because it is unclear as to whether the applicant intends to claim that the scan pulse is applied in any of the subfields subsequent to the first subfield, thus making a 112, 1st paragraph issue similar to claims 1 and 20, or whether the applicant has intended to claim that the scan pulse is applied so that all cells that will be written in any of the subfields will be written all at once in one subfield.

The specification, as discussed above with respect to the 35 U.S.C. § 112, first paragraph rejection, says only that it is not necessary to cause the *all-cell write discharge* to occur in SF3 and subsequent subfields at page 17, lines 13 and 14.

The Application, moreover, describes at page 17, lines 6-10, that:

The drive waveforms in SF2 are the same as the drive waveforms in SF1 in the first embodiment and the drive waveforms in SF3 and subsequent subfields are the same as the drive waveforms in SF2 and subsequent subfields in the first embodiment.

With respect to the first embodiment, the Application describes at page 14, lines 34-37, continuing at page 15, lines 1 and 2, that:

In SF2, the all-cell write discharge, which has been caused to occur in SF1 during the sustain period, is not caused to occur, but only the inclined wave-shaped charge control pulse is applied and the period NE is not provided. The subsequent subfields are the same as SF2 only with exception of the length of the sustain period.

Thus, the recitation “applying a scan pulse to the second electrodes and an address pulse to the third electrodes in order to write all the cells to be lit in any of the subfields subsequent to the first subfield in the display field in the address period” is submitted to be enabled within the meaning of 35 U.S.C. § 112, second paragraph. Withdrawal of the rejection is earnestly solicited.

Claim Rejections - 35 U.S.C. § 103:

Claims 1, 20, 23, and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over European Patent publication EP 1 1748 50 to Correa *et al.* (hereinafter “Correa”) in view of

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U.S. Patent No. 6,115,011 to Sano *et al.* (hereinafter "Sano"), and further in view of US Patent Application Publication No. 2002/0050794 to Ishizuka. The rejection is traversed.
Reconsideration is earnestly solicited.

The third clause of claim 1 recites:

Writing an all-cell write discharge in a second subfield having a second lightest luminance weight.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "writing an all-cell write discharge in a second subfield having a second lightest luminance weigh," as recited in claim 1. The Office Action acknowledges this deficiency with respect to Correa in section 10, in the first full paragraph at page 7, and attempts to compensate for the deficiency by combining Correa with Sano, saying in the second full paragraph at page 7 that:

Sano *et al.* disclose a method for driving a plasma display panel, comprising generating an all-cell write discharge in a priming period of every subfield (Figure 4 shows that there is a priming period in every single subfield.).

Since, as noted in the Office Action, Sano is generating an all-cell write discharge in a priming period of every subfield too, combining Sano and Correa would only replace the writing pulse of Correa with the all-cell write discharge of Sano, rather than "writing an all-cell write discharge in a second subfield having a second lightest luminance weigh," as recited in claim 1. Thus, even if Correa and Sano were combined as proposed in the Office Action, the claimed invention would not result.

The fifth clause of claim 1 recites:

Writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells," as recited in claim 1. The Office Action acknowledges this deficiency with respect to Correa and Sano in section 10, in the fourth full paragraph at page 7, and attempts to compensate for the deficiency by combining Correa and Sano with Ishizuka, saying in the fifth full paragraph at page 7 that:

Ishizuka discloses a method for driving a plasma display panel comprising writing in one subfield, after addressing, an inclined waveform suppress an accumulation of a wall charge in unselected cells (Figure 12 shows that Period 6 is after

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addressing and contains an inclined waveform applied to the scanning electrode. See paragraphs [0058]-[0060].

Ishizuka, to the contrary, is not "writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells" as recited in claim 1 either, and thus cannot make up for the deficiencies of either Correa or Sano in any case. Ishizuka, rather, is applying an erasing pulse of a gradually falling negative polarity to the *scanning* side, not "suppressing an accumulation of a wall charge in unselected cells" as recited in claim 1. In particular, as described at paragraph [0058]:

This is characterized in that a pre-sustaining erasing period is provided between the scanning period and the sustaining period of the above second embodiment, and an erasing pulse of a gradually falling negative polarity is applied to the scanning side.

Since, in Ishizuka, an erasing pulse of a gradually falling negative polarity is applied to the scanning side, Ishizuka is not "writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells" as recited in claim 1.

Ishizuka, moreover, applies a scanning pre-erasing pulse of a gradually reducing negative polarity to the *scanning* electrode, not to "unselected cells" as recited in claim 1. In particular, as described at paragraph [0060]:

In order to improve on this, the pre-sustaining erasing period is provided between the scanning period and the sustaining period, and by applying a scanning pre-erasing pulse of a gradually reducing negative polarity to the scanning electrode, the wall charge remaining on the scanning electrode and the sustaining electrode can be erased, and the settable range for the sustaining voltage can be increased.

Since Ishizuka applies a scanning pre-erasing pulse of a gradually reducing negative polarity to the scanning electrode, Ishizuka is not "writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells" as recited in claim 1. Thus, even if Correa and Sano were combined with Ishizuka as proposed in the Office Action, the claimed invention would not result.

Correa, finally, teaches away from the modification proposed in the Office Action by saying the problem of background luminance will *not* occur. In particular, as described at paragraph [0013]:

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And the problem of background luminance will not occur because the writing pulse in the self-priming sub-fields are not applied to cells which shall be black, only to the cells corresponding to non-zero pixel values where illumination is anyhow wanted.

Since Correa, which was cited as evidence of ordinary skill in the art, says the problem of background luminance will *not* occur, it is submitted that persons of ordinary skill in the art who read Correa for all it contained at the time the invention was made would not have been motivated to modify Correa as proposed in the Office Action, since the problem posed by "an accumulation of a wall charge in unselected cells," as recited in claim 1, did not occur to Correa. Claim 1 is submitted to be allowable. Withdrawal of the rejection of claim 1 is earnestly solicited.

Claim 23 depends from claim 1 and adds additional distinguishing elements. Claim 23 is thus also submitted to be allowable. Withdrawal of the rejection of claim 23 is earnestly solicited.

Claims 20 and 24:

The fourth clause of claim 20 recites:

Addressing, in at least one subfield including and subsequent to the second subfield and substantially near a head of the display field, all of the cells to be written in the respective address periods of the plurality of successive display subfields in the display field.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "addressing, in at least one subfield including and subsequent to the second subfield and substantially near a head of the display field, all of the cells to be written in the respective address periods of the plurality of successive display subfields in the display field," as discussed above with respect to the rejection of claim 1.

The fifth clause of claim 20 recites:

Writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "writing in said at least one subfield, after said addressing, an inclined waveform suppressing an accumulation of a wall charge in unselected cells," as discussed above with respect to the rejection of claim 1. Claim 20 is submitted to be allowable, for least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 20 is earnestly solicited.

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Claim 24 depends from claim 20 and adds additional distinguishing elements. Claim 24 is thus also submitted to be allowable. Withdrawal of the rejection of claim 24 is earnestly solicited.

Claim 25:

The fourth clause of claim 25 recites:

Applying a scan pulse to the second electrodes and an address pulse to the third electrodes in order to write all the cells to be lit in any of the subfields subsequent to the first subfield in the display field in the address period.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "applying a scan pulse to the second electrodes and an address pulse to the third electrodes in order to write all the cells to be lit in any of the subfields subsequent to the first subfield in the display field in the address period," as discussed above with respect to the rejection of claim 1.

In the claimed invention, the period "NE" corresponds to "applying a scan pulse to the second electrodes and an address pulse to the third electrodes in order to write all the cells to be lit in any of the subfields subsequent to the first subfield in the display field in the address period," between the address period and the sustain period of the SF 1 of the first embodiment shown in Fig. 7, or between the address period and the sustain period of the SF 1 of the second embodiment shown in Fig. 9.

Since the claimed invention has the period NE, it is possible to adjust the wall charges in the cells that are not to be lit in the relevant display field, and to suppress erroneous light, i.e. erroneous discharge. In the first embodiment, for example, the cells to be lit in the relevant display field are addressed by the SF 1, and the positive wall charges are generated on the second electrodes, i.e. the Y electrodes. Incidentally, since the difference in voltage between the third electrode, i.e. the A electrode, and the second electrode, i.e. the Y electrode, in the addressed cells become small when the negative slope waveform is applied in the period NE after the address period, the discharge for adjusting the charges is not generated.

In the cells that are not addressed, in contrast, the (negative) charges are left on the second electrodes, i.e. the Y electrode, by a reset processing in the reset period. Moreover, if surplus (negative) wall charges are generated by the reset processing, the address discharge is generated by applying the address pulse only to the third electrode, i.e., the A. electrode, which results in the occurrence of any erroneous display discharge. Consequently, the charges are

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adjusted due to the erasing discharges even if the surplus, i.e. negative charges are left on the second electrodes, i.e. the Y electrodes during the period NE in the cells not addressed, by applying the negative slope waveform and a pulse corresponding to the address pulse. Furthermore, the period NE of the SF2 in the second embodiment is the same as the above, and it is possible to suppress the erroneous light, i.e. erroneous discharge in the cells that are not to be displayed and lit by the discharge adjustment.

The fifth clause of claim 25 recites:

Applying, to the second electrodes, a third-waveform voltage in which the applied voltage decreases as time lapses.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "applying, to the second electrodes, a third-waveform voltage in which the applied voltage decreases as time lapses," as discussed above with respect to the rejection of claim 1. Claim 25 is submitted to be allowable, for least those reasons discussed above with respect to the rejection of claim 1.

Withdrawal of the rejection of claim 25 is earnestly solicited.

Claim 26:

The fourth clause of claim 26 recites:

Applying, to the second electrodes, a second-waveform voltage in which the applied voltage decreases as time lapses, and wherein the second subfield applies a scan pulse to the second electrodes and an address pulse to the third electrodes in order to write all the cells to be lit in any of the subfields including and subsequent to the second subfield in the display field in the address period.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "applying, to the second electrodes, a second-waveform voltage in which the applied voltage decreases as time lapses, and wherein the second subfield applies a scan pulse to the second electrodes and an address pulse to the third electrodes in order to write all the cells to be lit in any of the subfields including and subsequent to the second subfield in the display field in the address period," as discussed above with respect to the rejection of claim 1.

The fifth clause of claim 26 recites:

Applying, to the second electrodes, a third-waveform voltage in which the applied voltage decreases as time lapses, and applying a positive pulse to the third electrodes between the address period and the sustain period.

Neither Correa, Sano, nor Ishizuka teach, disclose, or suggest "applying, to the second

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electrodes, a third-waveform voltage in which the applied voltage decreases as time lapses, and applying a positive pulse to the third electrodes between the address period and the sustain period," as discussed above with respect to the rejection of claim 1. Claim 26 is the submitted to be allowable, for least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 26 is earnestly solicited.

Conclusion:

Accordingly, in view of the reasons given above, it is submitted that all of claims 1, 20, and 23-26 are allowable over the cited references. Allowance of all claims 1, 20, and 23-26 and of this entire application is therefore respectfully requested.

Finally, if there are any formal matters remaining after this response, the Examiner is invited to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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